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FOR: APPARATUS AND METHOD FOR ROUTING COMMUNICATIONS

REQUEST FOR PRIORITY UNDER 35 U.S.C. 119 AND THE INTERNATIONAL CONVENTION

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

In the matter of the above-identified application for patent, notice is hereby given that the applicant claims as priority:

COUNTRY	APPLICATION NO	DAY/MONTH/YEAR
Great Britain	9901036.5	18 January 1999

Certified copies of the corresponding Convention application(s) were submitted to the International Bureau in PCT Application No. PCT/GB00/00114. Receipt of the certified copy(s) by the International Bureau in a timely manner under PCT Rule 17.1(a) has been acknowledged as evidenced by the attached PCT/IB/304.

Respectfully submitted,
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PCT/GB 00/00114

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Concept House
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South Wales
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REC'D 23 MAR 2000
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Dated 07 March 2000

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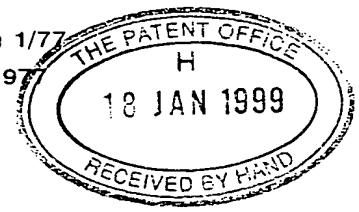
(Rule 16)



The Patent Office

Request for grant of a patent

The Patent Office
Cardiff Road
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1. Your reference
5292801/CF

2. Patent Application Number
18 JAN 1999

3. **9901036.5** de of the or of each applicant *(underline all surnames)*

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Patents ADP number *(if known)* 7478688CC1

If the applicant is a corporate body, give the country/state of its incorporation — Country: ISLE OF MAN

4. Title of the invention
APPARATUS AND METHOD FOR ROUTING COMMUNICATIONS

5. Name of agent — **Beresford & Co**

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Patents ADP number 18266C1

6. Priority details

Country	Priority application number	Date of filing

Patents Form 1/77

7. If this application is divided or otherwise derived from an earlier UK application give details

Number of earlier of application — Date of filing

8. Is a statement of inventorship and or right to grant of a patent required in support of this request?

YES

9. Enter the number of sheets for any of the following items you are filing with this form.

Continuation sheets of this form	0
Description	23
Claim(s)	4
Abstract	0
Drawing(s)	8 7

10. If you are also filing any of the following, state how many against each item.

Priority documents	
Translations of priority documents	
Statement of inventorship and right to grant of a patent *(Patents form 7/77)*	
Request for preliminary examination and search *(Patents Form 9/77)*	1
Request for Substantive Examination *(Patents Form 10/77)*	
Any other documents *(please specify)*	

11. I/We request the grant of a patent on the basis of this application

Signature BERESFORD & Co — Date 18 January 1999

12. Name and daytime telephone number of person to contact in the United Kingdom — CHRIS FLEGG

Tel:0171-831-2290

APPARATUS AND METHOD FOR ROUTING COMMUNICATIONS

The present invention relates to an apparatus and method for telephone communication from mobile cellular telephones and is particularly concerned with an apparatus and method for routing communication to a call destination along a preferential route.

In recent years many countries have liberalised their telecommunications systems. As a result, when a user operates a telephone, the user increasingly has a choice as to the networks used to carry his message. Each network has typically a different set of characteristics such as geographical extent, speed of transmission, and an associated cost.

Devices are known which automatically route messages along the route of least cost for use with fixed (land line) telephone apparatus. As the route costings of the networks change, the routing information stored in these devices needs to be updated as the least cost route may have changed. This updating is done by sending updated information along the telephone lines to the least cost route device.

The present invention seeks to provide improved facilities for users of mobile cellular telephones. At present, it is normal for such users of mobile cellular telephones to have the facility to register with only a single service provider, with optionally a ramming facility which allows one or more additional service providers to be used from the same mobile telephone. The user however is left to make his own decision as to which service provider to use for a particular call and is required to manually select the service provider and hence the communication channel required for the call.

According to the present invention there is disclosed a method of operating a mobile telephone in a cellular telephone communications system in which a plurality of service providers provide respective alternative communications channels; comprising the steps of;

storing predetermined routing information in the mobile telephone to facilitate identification of a preferred route dependent upon user generated call destination information;

originating an outgoing telephone call by the input of the user generated call destination information;

determining preferred route information from the stored routing information;

selecting a communication channel in accordance with the preferred route information; and

establishing communication for the outgoing telephone call for a call destination corresponding to the call destination information via the selected communication channel of the selected service provider.

Preferred embodiments of the present invention will now be described by way of example only and with reference to the accompanying drawings of which;

Figure 1 is a schematic representation of a mobile telephone connected to telephone networks via any one of a plurality of cellular phone service providers;

Figure 2 is a schematic representation of the functional elements of the mobile telephone of Figure 1;

Figure 3 is a schematic representation of the functional elements of the mobile telephone of Figure 1 showing detail of the selection of look-up table information;

Figure 4 is a schematic diagram of the telephone number including prefix code added by the routing means;

Figure 5 is a schematic diagram of a further embodiment of a telephone operated under software control by a processor;

Figure 6 is a flow chart illustrating operation of the telephone of Figure 5;

Figure 7 is a flow chart illustrating the process of initiating an outgoing call; and

Figure 8 is a schematic diagram showing available channels for use by a mobile telephone.

Figure 1 illustrates schematically the manner in which a mobile telephone 1 is able to make a telephone call to a destination telephone 2 which in this example is connected via land lines to a local exchange 6. The local exchange 6 is accessible via any one of a number of interconnected conventional (land line) telephone networks 5A, 5B, 5C operated by respective network operators.

Figure 1 illustrates cellular phone service providers 4A, 4B and 4C, each connected to the conventional telephone networks 5A, 5B and 5C, the cellular phone service providers having base stations arranged to provide cellular communications. In some instances, base stations may be physically shared by the service providers but for the purpose of explanation these are represented as distinct base station locations in Figure 1.

Wireless telemetry communication between the mobile telephone 1 and the cellular telephone service provider base stations conforms to conventional protocols in which distinct sets of frequencies are made available to the different service providers.

Each cell of the system will typically define a geographical area within which mobile telephones can operate on any one of a number of frequencies depending upon the selected service provider and the relative reception characteristics of frequencies used by that service provider within the cell. For a given frequency, multiple users are accommodated using data packet multiplexing of digital data. For the purposes of the present description, the term "channel" will be used to refer to the communication facilities provided by a single service provider so that each of the service providers 4A, 4B, 4C makes available a respective channel for multiple users.

The mobile telephone 1 of the present invention is provided with a least cost routing means enabling the telephone to select, without user intervention, a preferred route for connection to the telephone 2 based on the input by the user of the call destination telephone number. The telephone determines the preferred route with reference to routing information stored in the

mobile telephone 1, the selection being made on the basis of call destination and other parameters such as time and calendar data.

A selection of the preferred route firstly entails selection of which of the cellular telephone service providers 4A, 4B and 4C should receive the outgoing call from the telephone 1. For many calls, particularly to destination telephones 2 which themselves are mobile telephones (not shown in Figure 1), this choice of service provider will uniquely determine the forward routing of the connection to the destination telephone 2. In other instances, there will remain a number of available options for forward connection from the service provider 4 to the telephone 2, for example via any one of the networks 5A, 5B and 5C. The selected route will therefore need to define in these instances the preferred (land line) network and this is accomplished by additionally prefixing the telephone number dialled by the user with a prefix code stored in memory within the mobile telephone 1.

A control centre 7 is also connected to the telephone networks and is therefore in communication with both the networks 5A, 5B, 5C and the cellular telephone service providers 4A, 4B, 4C.

In the following description of preferred embodiments, reference is made to a least cost routing means (LCRM). Such LCRM is to be understood to be an example of a routing device in accordance with the present invention and that, although the predetermined information on which the routing device operates will typically be decided on the basis of least cost routing, the information may equally well be determined on the basis of network availability, level of use of networks, or other factors, or a combination of the above which may be appropriate to particular operating circumstances. It is important to note that the least cost routing means is notionally unaware of the basis on which the routing decision is determined, this decision being conducted remotely therefrom by a control centre and the results of the decisions for each parameter such as call destination being made available in the form of a look-up table.

The cellular telephone service providers 4A, 4B, 4C and the operators of networks 5A, 5B, 5C send billing information containing details of the caller's telephone number, the called telephone number and the duration of the call, to the control centre 7. The control centre 7 subsequently bills the caller. In this way, rather than receiving separate bills from each of service providers 4A, 4B, 4C and of the networks 5A, 5B, 5C, for each accounting period, a caller receives one bill from

the control centre 7. The operator of the control centre 7 pays each service provider and network operator for the time used on its network. Such networks may be public or private data networks and may include the internet. Such networks may therefore include data networks not originally or primarily intended for carrying voice traffic.

The control centre 7 collates costing information to determine the current rates charged by the cellular telephone service providers and network operators for communicating between any two telephones 1, 2 and the least cost route is calculated by the control centre 7 for given time periods. Typically service providers and network operators charge at different rates for different times of the day, there being typically a peak charge time period and an off peak time period, these rates also typically differing according to the day of week. Whenever a change in the cost of using a cellular service or network occurs, the comparison between the cost of each route must be repeated in order to revise the decision as to which of the available routes is a least cost route. The results of this decision must then be passed on to the LCRMs 3. In order to update the routing information stored in each LCRM 3, data to which the LCRM 3 refers by addressing a look up table is periodically transmitted to each mobile telephone 1.

The updated least cost route information broadcast by the control centre 7 to each LCRM 3 via at least one of the cellular telephone service providers is preferably encrypted and compressed as a coded signal.

It is envisaged that in accordance with a first embodiment such transmission of updating information to the LCRMs 3 would be made as a multipoint broadcast during periods of minimum or off peak cellular telephone traffic.

Both routing and subsequent billing via the control centre 7 are determined by adding dialling information to the user generated number.

Figure 4 illustrates a schematic diagram of the dialling information sent from an LCRM 3 in this embodiment.

The dialling information conforms to the 1xxx standard whereby the first digit sent is "1" followed by a number "XXX" (network reference 50) which indicates the network 5 through which the call is to be routed. A charging information field is then transmitted which includes a control reference number 51 which indicates to the appropriate network service provider that the operators of the control centre 7 need to be billed for the cost of the call. A customer identification field including

customer reference number 52 is then sent which is forwarded to the control centre 7 so that the operator of the control centre may bill the user of the telephone 1. Finally the user generated dialled number 53 is transmitted.

In this embodiment, the mobile telephone forms part of the GSM network in which a service named Cell Broadcast is utilised to send short messages to all mobile telephones in a given geographical area as a multipoint broadcast message.

In the example of Figure 2, the Cell Broadcast service is used to send updating information for updating the least cost route tables stored in the mobile telephone. This is illustrated schematically in the right hand portion of Figure 2 which illustrates that the message data handling circuit 121 of the mobile telephone is used to input data to a decision table 122 corresponding functionally to the LCRM tables 134 and 135 described below with reference to Figure 3. The processor of the mobile phone includes a route selector 123 which refers to the decision table 122 before processing a user input call destination to determine the channel to be used for the outgoing call to a selected service provider and to enable an appropriate prefix to be added to the user dialled number. A transmitter and receiver circuit 124

is provided for transmitting and receiving transmissions of telephone calls and to receive the Cell Broadcast message data input to the message data handling circuit 121.

Further embodiments will now be described using corresponding reference numbers for corresponding features where appropriate.

Figure 3 illustrates schematically an example of a mobile telephone 1 having routing means having decision tables referred to below as look-up tables 134,135. An input device 130 receives an input signal representative of a user generated call number which defines the user selected call destination. Routing information is obtained by accessing the look-up tables 134 and 135, only one of which is currently designated as being active by an active memory designating means 140. The active memory is designated according to which of the tables 134 and 135 was last updated, thereby leaving an inactive memory to await the receipt of further updating information, following receipt of which it will then become the active memory.

As shown schematically in Figure 3, an updating device 136 is available to update Table 2, the currently inactive memory, while a selector 133 is available to

select routing information from Table 1, the currently active memory, in dependence upon the data input to the selector 133 from the input device 130. In this way, a user generated call destination in the form of a dialled telephone number is used by the selector 133 to generate an address for accessing the memory of the currently active look-up table. Data is read from the address by a data reader 301 and input to a communications channel selector 300 and a code generator 131.

The communications channel selector 300 selects a communications channel to be used for wireless communication between the mobile telephone and a base station of the system and is connected to the transmitter 302 and receiver 137 to allow setting of the appropriate channel frequency and protocol for communication.

The code generator 131 prefixes the input signal with a prefix signal which is representative of a selected prefix code defining the preferred (land line) network connection route and including other data relating to customer identification and charging as illustrated in Figure 4.

Although the selector 133 locates the required routing information primarily in response to an input from the input device 130 of the destination call number, the

address information also includes time period data and day of the week data from a calendar 141. The updating device 136, which updates whichever of the decision tables 134 and 135 is currently inactive, receives updating information from the receiver 137 and a decoder 138.

A clock 139 and the calendar 141 are also updated by the received broadcast information via the receiver 137 for providing the additional address information for the selector 133 in addressing the look up tables 134 and 135.

The routing information may be updated at any time but would preferably be updated either at regular intervals, preferably between one day and one month, or whenever the preferential routing information changes.

Figure 5 illustrates a further embodiment of a mobile telephone in which a processor 500 controls operation of the various sub-units of the telephone by software implementation. As shown schematically in Figure 5, the processor 500 is connected via a databus to a read only memory 501, a random access memory 502, a data input 503 in the form of a keypad and a display 504 in the form of a liquid crystal display. A SIM card 505 is also connected to the databus and contains identifying

information which is unique to the telephone and user.

Also connected to the databus is an audio processor 506 connected to a microphone and speaker circuit 507. The databus is also connected to transmitter and receiver circuits 509 connected to an antenna 510.

The random access memory 502 includes look-up tables corresponding to the tables 134 and 135 described above with reference to Figure 3, the tables being accessed in a similar manner, except that the functions of the selector 133, clock 139, calender 141, data reader 301, and communications channel selector 300 of Figure 3 are performed in the embodiment of Figure 5 by the processor 500 and associated circuits described above.

Conventional mobile telephones are generally capable of being registered to a single mobile telephone service provider, even though the telephone includes circuitry which is capable of registering the telephone with any one of a plurality of available service providers. The process of registration which is performed each time the telephone is switched on or moves into an area falling within an active cell of the communications system involves transmission of an identification code stored in the SIM card to the service provider. The service provider registers the identification information and

allocates facilities including a communications channel for received calls to be routed to the telephone and for outgoing calls to be made via the service provider.

Mobile telephones in accordance with the present invention perform this registration procedure as shown in Figure 6 by first scanning available communication channels for which it has functional capability in order to obtain information on which service providers have channels currently available. When a service provider of an available channel is identified in this manner, the telephone attempts to complete registration over the appropriate communication channel. On completion, the telephone then locates any further service providers and completes registration in turn so that the telephone will be simultaneously registered with a plurality of service providers. In order to complete this task, it may be necessary for the SIM to contain a plurality of respective identification codes appropriate to the requirements of the different service providers.

This process of scanning available communication channels, typically on different operating frequencies, is repeated at scanning intervals of several minutes in order to maintain an up-to-date list of available service providers with which the telephone is registered. Typically this will require operating at a plurality of

different frequencies to access the channels of the respective service providers.

As illustrated in Figure 8, the telephone 1 elects one particular service provider to provide a "home" channel for receiving incoming telephone calls to the telephone so that the home channel thereafter requires continuous monitoring by the telephone. Operation of the transmitter and receiver circuits 509 to additionally perform scanning and registration therefore requires the capability to operate simultaneously at two different frequencies or to switch rapidly from one frequency to another so that any incoming call signals are not missed on the home channel.

When, as part of the ongoing monitoring procedure, a service provider is newly identified as having an operating frequency which is usable within the current cell, the telephone 1 transmits a message to the newly found service provider to indicate the presence of the telephone and include the identification information contained in the SIM card. After authentication procedure by the service provider in order to confirm that the user of the telephone is validly authorised for use of the service, a communication channel facility is established between the telephone and the service provider. The telephone 1 then requests from the service

provider an indication of whether least cost routing information is to be broadcast by this service provider and received in the newly opened communications channel. In this way the processor 500 is able to maintain a running check on the identity of the service provider forwarding received (incoming) messages to the telephone and which of the available service providers will be sending the updating information for the look-up tables 134 and 135. In the example of Figure 8, service provider 4D provides updating information and service provider 4A provides the "home" channel for received calls.

Having identified the service provider which will be forwarding the updating information for the look-up tables, the telephone requests information defining the frequency with which the telephone should forward a request for updating information to the service provider. When this information is received, the processor sets in progress a routine such that a request for updating information is automatically generated by the telephone 1 and communicated to the responsible service provider 4D at the required interval. In response to such a request, updating information is communicated via the communications channel to the telephone 1 and stored in whichever of the look-up tables 134 and 135 is currently inactive, following a procedure analogous to the

procedure described above with reference to the embodiment of Figure 3.

In this way, updating information can continue to be received and stored in the inactive table while routing information is being simultaneously extracted from the currently active table on demand.

To deal with the eventuality that more than one of the acquired service providers indicates that it is available to provide updating information, or more than one service provider indicates that it is to forward incoming messages, the CPU is provided with a routine for arbitrating to elect only one such service provider in each instance, as appropriate.

According to a further modified embodiment, the updating information additionally includes identification information providing authorization for use with additional service providers. This is appropriate in instances where the telephone SIM card contains only identification information providing authorization for use of a single service provider, or an incomplete set of service providers where additional service providers are in fact available for operation.

The provision of this additional identification

information then facilitates registration of the telephone with all available service providers.

In use, a user of the telephone 1 initiates an outgoing call by inputting a telephone number corresponding to a desired call destination using the keypad input 503 of Figure 5. The processor 500 determines from the RAM 502 which is the look-up tables 134 and 135 is currently designated as being active and generates an address of the look-up table corresponding to the user generated call number, the current time indicated by clock 508 and other parameters for which the processor is programmed to utilise in address generation. The preferred route information is read from the selected look-up table and utilised to determine the selected channel for operation of the transmitter and receiver circuits 509 which are then instructed accordingly by the processor, setting the required frequency and communications protocol.

The call is initiated by transmission by the transmitter circuit to the base station of the service provider of the selected channel.

As shown in Figure 1, the selected service provider 4A receives the transmission and establishes forward connection to the call destination telephone 2 via whichever of the networks 5A, 5B and 5C is indicated in

accordance with the preferred route information.

Connection is established between the telephone 1 and the call destination 2 and the telephone call proceeds. Billing information is collated by the control centre 7 for subsequent payment of the telephone user and payment to the service provider and selected network.

In this way, routing information determined on a least cost basis enables the user of the telephone to maximise efficiency in making calls over several networks.

In the event that the preferred route information cannot be successfully utilised because one or other of the service provider channels or networks is unavailable, a second choice is read from the look-up table and connection again attempted. If this second choice route also fails, a default connection mode is adopted in which connection is made using the home channel to a service provider who then has responsibility for determining the route for forward connection to the destination 2.

Optionally, a prefix number may be added to the user generated telephone number, including the information referred to above with reference to Figure 4.

According to a further alternative embodiment, the

processor would be programmed to provide for registration only with a single service provider. At the point of selection of the preferred route and preferred service provider for cellular communication, the telephone would then, if the preferred route indicates a service provider other than the presently registered service provider, initiate registration with the preferred service provider in the manner indicated above. On completion of registration, the routing of the telephone call then proceeds by selecting the preferred communication channel and adding the prefix code to the dialled number input by the user to the keypad input 503.

If however registration at this point is not possible, for example because a lack of signal strength means that the communications channel of the service provider selected is not in fact available, the processor is programmed to repeat the selection process to access a second choice route. If no preferred route can be accessed, the processor is programmed to adopt a default route which uses the communication channel of the already registered service provider.

Although in the described embodiments communication has been described as occurring between a mobile telephone 1 and a telephone 2, the terminal destination may alternatively be any form of telecommunications

apparatus, for example a facsimile machine or computer modem, a combination of telephone with radio, alarm clock, answering machine and the like. Alternatively the telephone 2 may be a private exchange such as private automatic branch exchange (PABX) or a network signal router. Similarly, the mobile telephone may be any form of mobile cellular terminal and the above embodiments should be broadly construed accordingly.

In Figure 1 the local exchanges 6 are shown separate from the networks 5A, 5B, 5C. However, the local exchanges 6 may also form part of a network.

Although in this embodiment the control centre 7 is connected to the networks 5A, 5B, 5C via the public service telephone network so that the networks 5A, 5B, 5C can transmit billing information to the control centre 7, alternatively the billing information may be sent by any other suitable link, for example a satellite link which does not form part of the networks 5A, 5B, 5C. Different networks 5A, 5B, 5C may send their billing information to the control centre 7 by different ways.

It will be appreciated that the teaching of the described embodiments may be applied to other GSM-based mobile telephone networks or Code Division Multiple Access (CDMA) based networks. An example of a suitable mobile

phone network is the Personal Handyphone System (PHS).

CLAIMS:

1. A method of operating a mobile telephone in a cellular telephone communications system in which a plurality of service providers provide respective alternative communications channels; comprising the steps of;

storing predetermined routing information in the mobile telephone to facilitate identification of a preferred route dependent upon user generated call destination information;

originating an outgoing telephone call by the input of the user generated call destination information;

determining preferred route information from the stored routing information;

selecting a communication channel in accordance with the preferred route information; and

establishing communication for the outgoing telephone call for a call destination corresponding to the call destination information via the selected communication channel of the selected service provider.

2. A method as claimed in claim 1 wherein the preferred routing information comprises the results of a route selection decision based on least cost.

3. A method as claimed in any preceding claim wherein the routing information is stored in look-up table

format.

4. A method as claimed in any preceding claim including the step of transmitting the routing information to be stored in the telephone by means of a multipoint broadcast.

5. A method as claimed in any preceding claim wherein the preferred route information determines a choice of network for forward connection between a base station of the selected communication channel service provider and the call destination.

6. A method as claimed in claim 5 wherein a control centre collates billing information in respect of services provided by the service provider and one or more networks in facilitating the call to the call destination.

7. A method as claimed in any of claims 5 and 6 wherein the mobile telephone adds a prefix code to the user generated call information.

8. A method as claimed in claim 7 wherein the prefix code includes a customer identification field containing user specific identification data.

9. A method as claimed in claim 8 wherein the prefix code includes a charging information field for identifying a control entity to be billed by a network provider corresponding to the selected network connection route.

10. A method as claimed in any preceding claim including the step of the telephone periodically scanning received transmissions to identify available communications channels and completing a registration procedure for all available channels in order to facilitate subsequent communication.

11. A method as claimed in claim 10 including the step of electing a channel as a home channel for receipt of incoming calls.

12. A method as claimed in any of claims 10 and 11 including the step of determining a selected channel for receipt of updating information broadcasts.

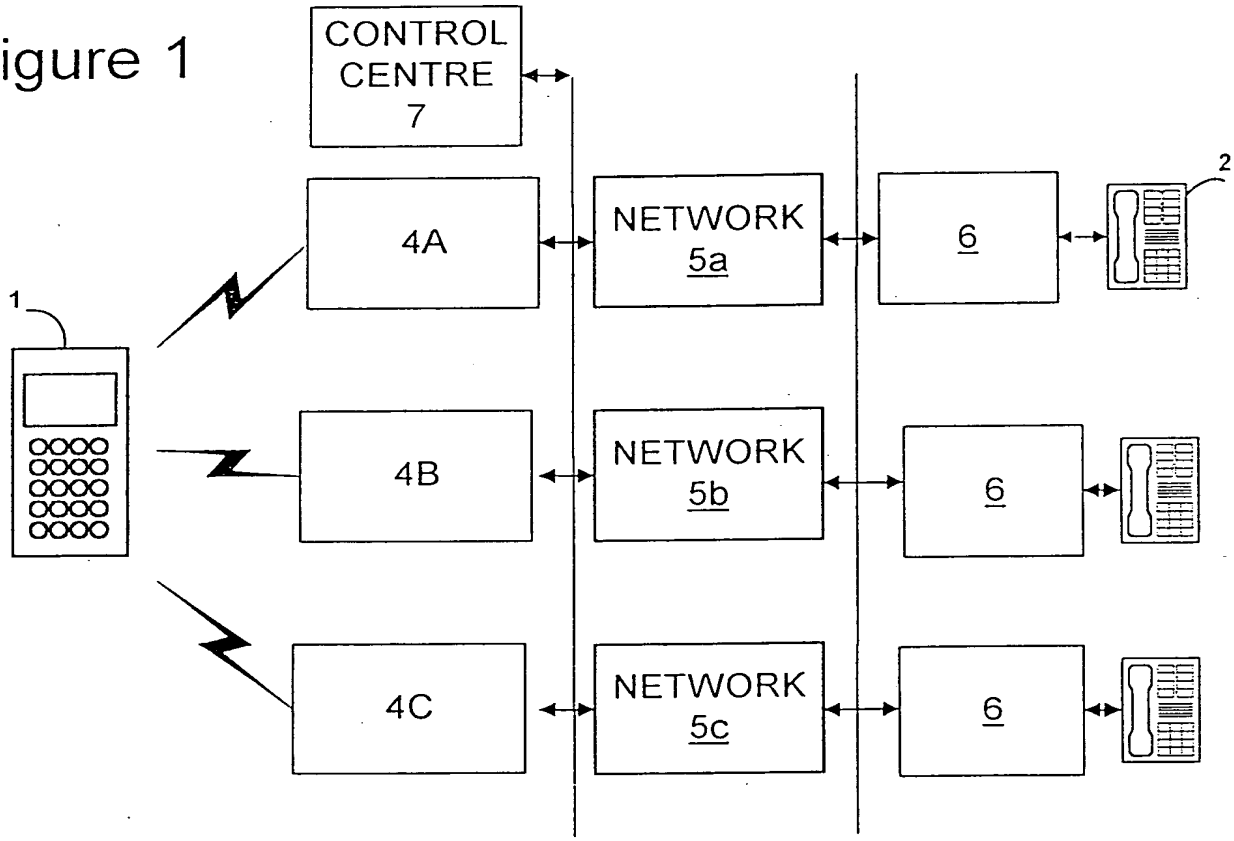
13. A method of operating a cellular telephone communications system so as to facilitate a method of operating a mobile telephone as claimed in any preceding claim.

14. A method of providing a communications channel for

use in a cellular telephone communications system so as to facilitate a method of operating a mobile telephone as claimed in any of claims 1 to 12.

15. A mobile telephone for use in a cellular telephone communications system having means for selecting one of a plurality of available communications channels on the basis of predetermined least cost routing information stored in the telephone.

Figure 1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NETWORK 5a
6
2
1
4B
NETWORK 5b
6
4C
NETWORK 5c
6

Fig 2

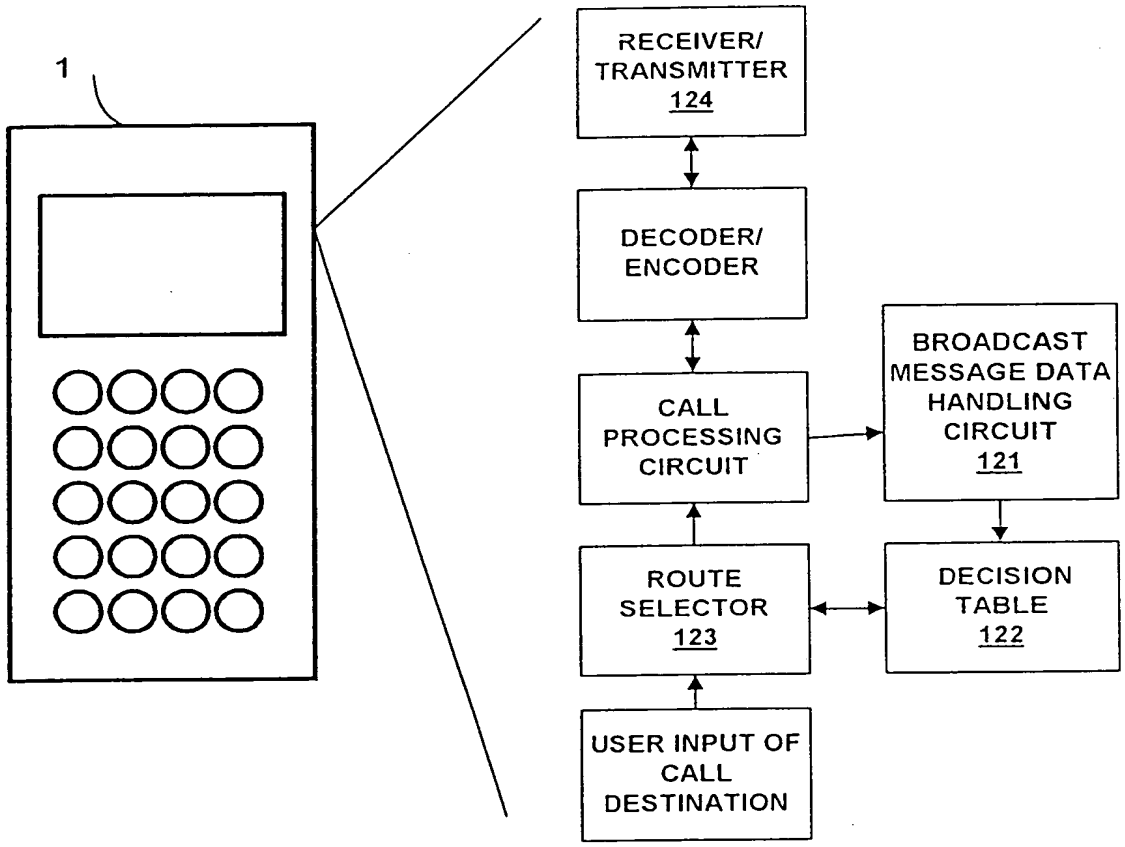
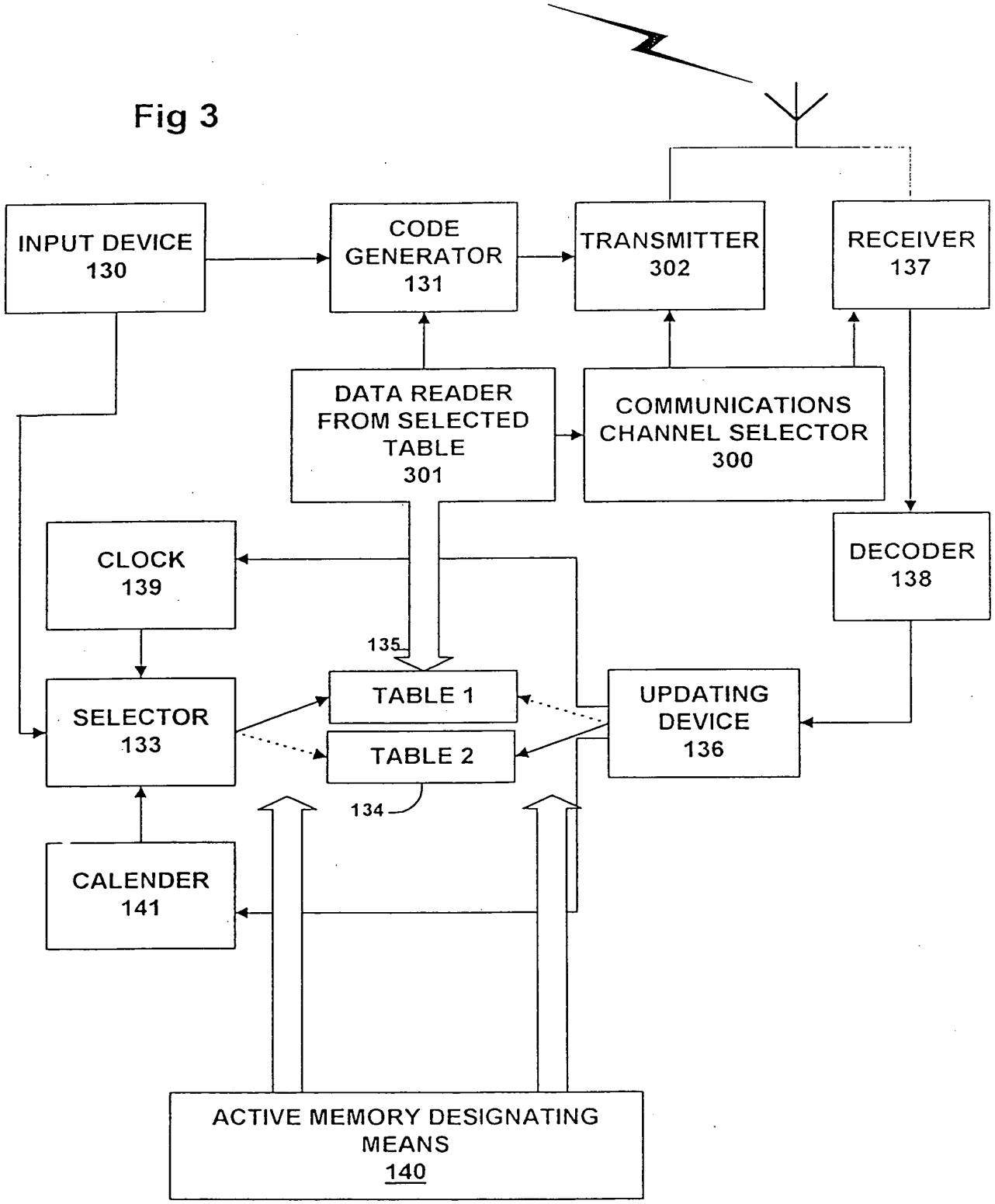

1
RECEIVER/ TRANSMITTER 124
DECODER/ ENCODER
CALL PROCESSING CIRCUIT
BROADCAST MESSAGE DATA HANDLING CIRCUIT 121
ROUTE SELECTOR 123
DECISION TABLE 122
USER INPUT OF CALL DESTINATION

Fig 3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GENERATOR
131
TRANSMITTER
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RECEIVER
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DATA READER
FROM SELECTED
TABLE
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COMMUNICATIONS
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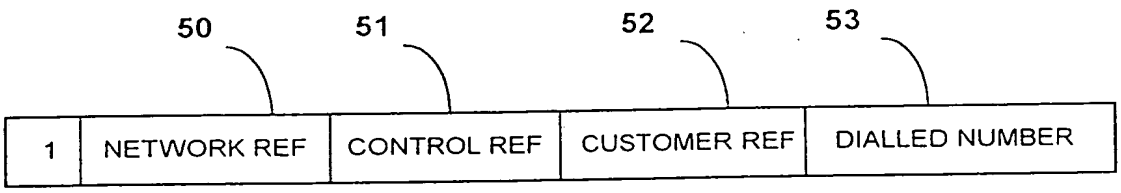
CLOCK
139
DECODER
138
135
SELECTOR
133
TABLE 1
TABLE 2
UPDATING
DEVICE
136
134
CALENDER
141
ACTIVE MEMORY DESIGNATING
MEANS
140

Figure 4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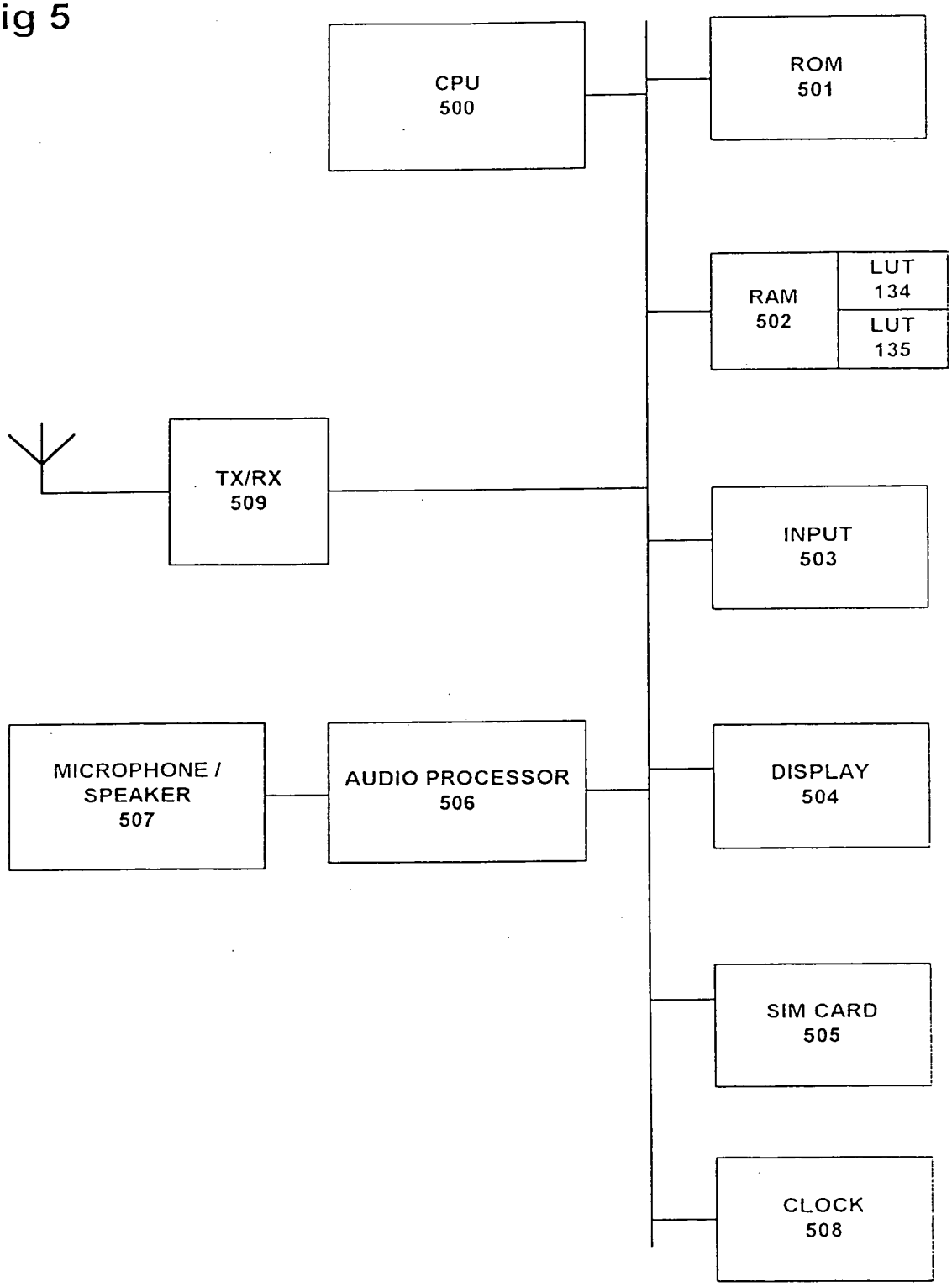
51
52
53
1
NETWORK REF
CONTROL REF
CUSTOMER REF
DIALLED NUMBER

Fig 5


CPU
500
ROM
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RAM
502
LUT
134
LUT
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TX/RX
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INPUT
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MICROPHONE /
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DISPLAY
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SIM CARD
505
CLOCK
508

Fig 6

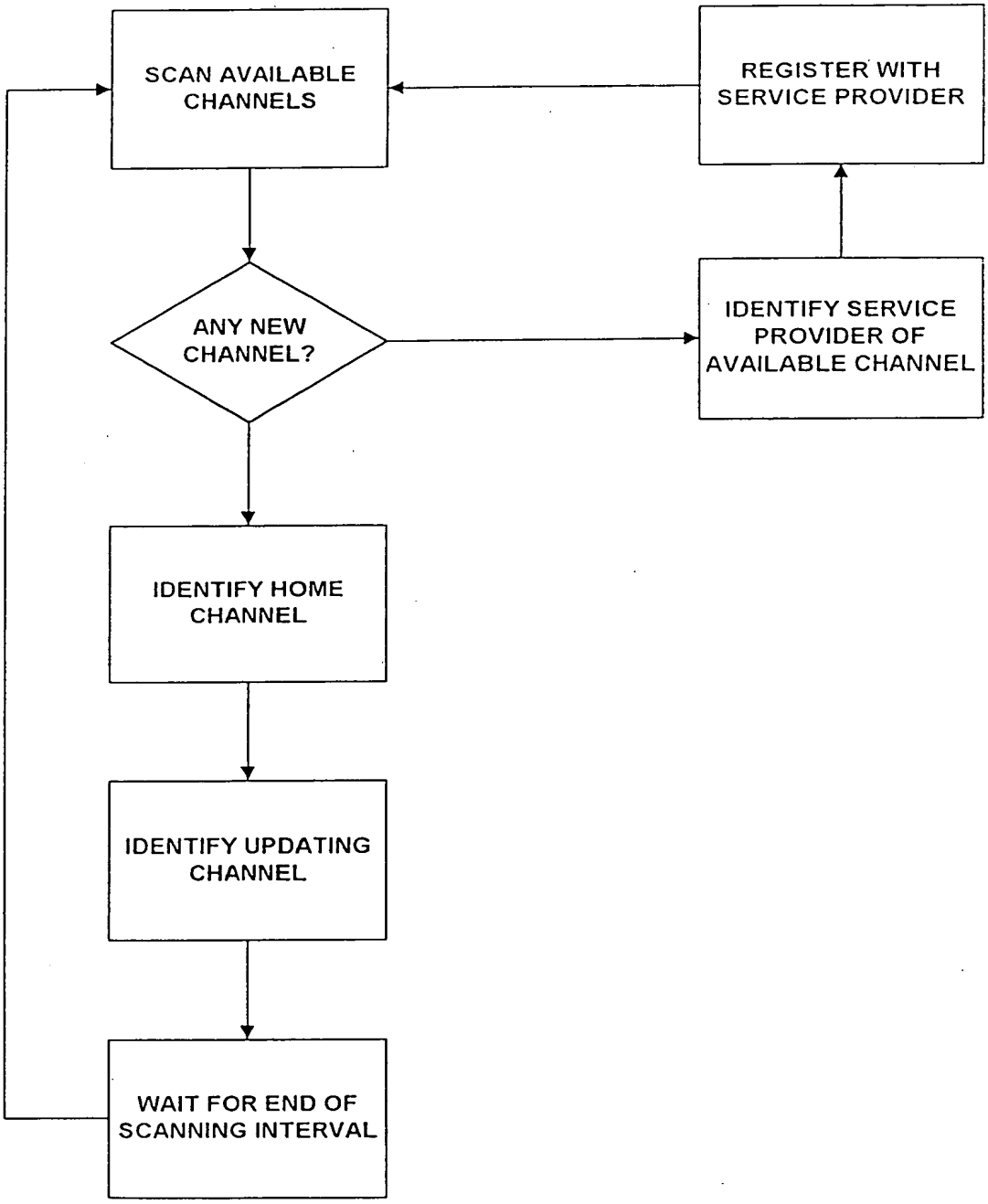

SCAN AVAILABLE CHANNELS
REGISTER WITH SERVICE PROVIDER
ANY NEW CHANNEL?
IDENTIFY SERVICE PROVIDER OF AVAILABLE CHANNEL
IDENTIFY HOME CHANNEL
IDENTIFY UPDATING CHANNEL
WAIT FOR END OF SCANNING INTERVAL

Fig 7

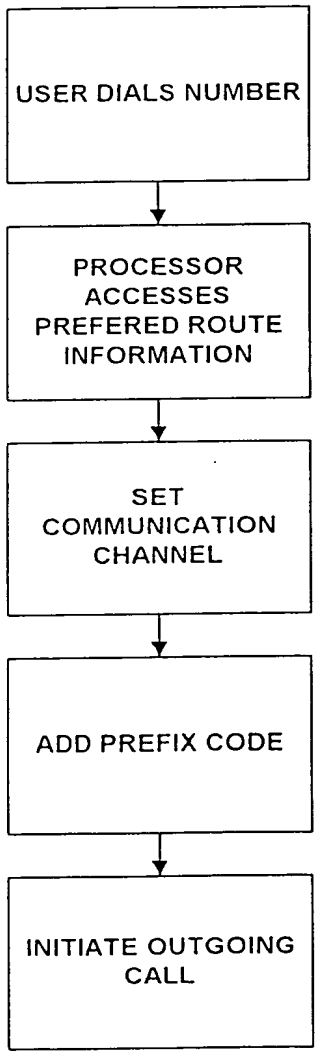
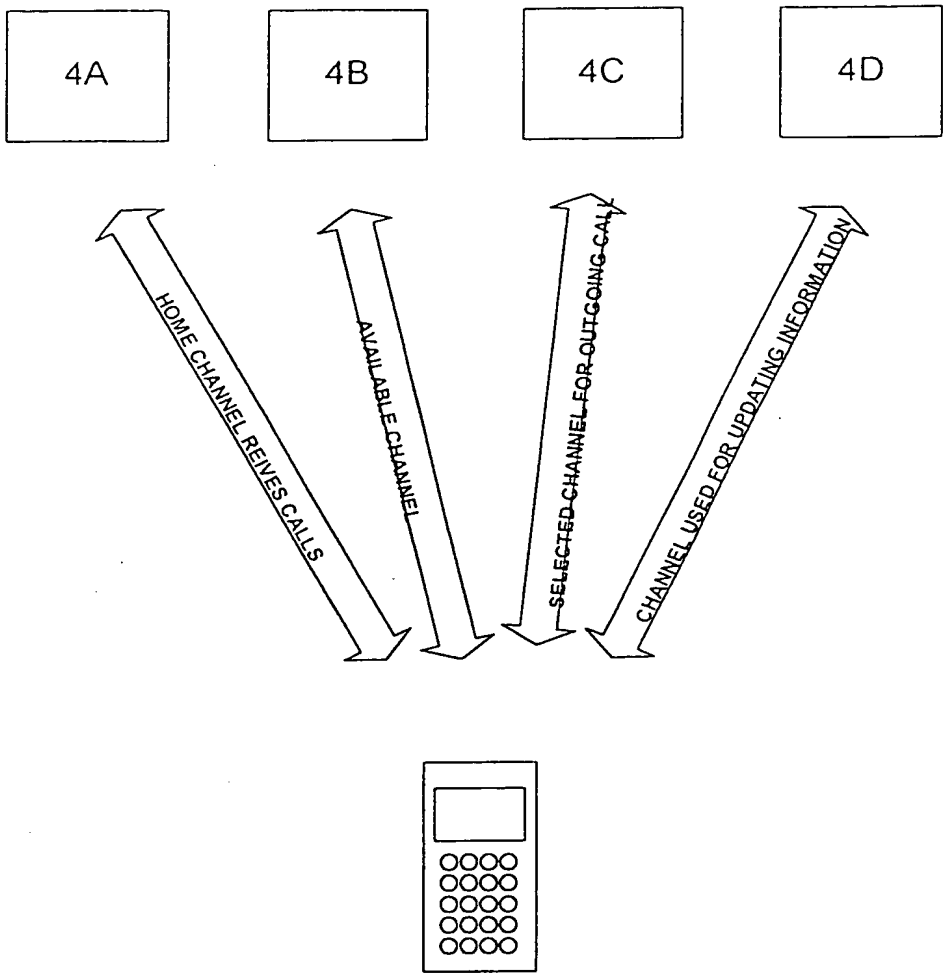

USER DIALS NUMBER
PROCESSOR ACCESSES PREFERED ROUTE INFORMATION
SET COMMUNICATION CHANNEL
ADD PREFIX CODE
INITIATE OUTGOING CALL

Fig 8


4A
4B
4C
4D
HOME CHANNEL REIVES CALLS
AVAILABLE CHANNEL
SELECTED CHANNEL FOR OUTGOING CALL
CHANNEL USED FOR UPDATING INFORMATION

GB 00/00114

14/2/00

Beresford + Co